

Chesapeake Bay Implementation Grants -- Maryland Streams Education

PROJECTS FUNDED 2015-16

All projects currently funded under this initiative incorporate field investigations and other activities provided by the Maryland Department of Natural Resources (DNR) Explore and Restore Maryland Streams program, often combining DNR's resources with their own or others, and some are building on these to develop new instructional or student resources. All projects include professional development for educators, classroom learning, and student field experiences at a local stream; and aim to have students analyze their observations from the field to determine ways to improve water quality or habitat, to inform their subsequent, student-designed stewardship and outreach projects. Many projects include interaction with professionals for technical assistance and to build environmental career awareness among students.

The following projects are underway for the 2015-16 school year:

- 1. The Students for Streams** program integrates DNR stream education resources into all environmental science classes in Dorchester and Queen Anne's County public high schools. The **Midshore Riverkeeper Conservancy** is providing teacher development, assisting with outdoor experiences for the 500 students in the two counties, and providing classroom support where needed. Students for Streams will be integrated into existing curriculum within the four high schools. It involves investigative water quality monitoring with both structured and unstructured outdoor learning experiences with classroom instruction. The program concludes with a student-chosen action project that benefits both the local stream and communities around their schools. The long-term goal of this program is to expand throughout the Eastern Shore and Maryland through programmatic professional development.
- 2. The Audubon Stream Exploration and Restoration Project**, led by **Pickering Creek Audubon Center**, is engaging the high school environmental science classes from all of the secondary schools in Wicomico and Caroline counties. The 615 students included are learning about stream and buffer health, aquatic life in local streams and creeks, and the health of Audubon priority bird species. Through a series of school and field experiences students are exploring the stream health at Pickering Creek's 400-acre farm and participating in restoration practices that improve water quality and provide important habitat. The lessons learned from exploration at Pickering Creek transfer back to their schoolyard where students assess their local watershed and then plan and implement a project to improve stream, creek or river health in their own backyard. Teacher professional development is mirroring student experiences, which is preparing teachers to lead key aspects of the program with their students in future years.
- 3. The Your Watershed, Your Backyard Program**, part of the BioEyes program of the **Carnegie Institution for Science**, is including Baltimore City 6th and 7th graders in three annual Meaningful Watershed Educational Experiences and a robust program of professional development for teachers. Eight Baltimore City public schools and one Baltimore County public school are attending a field trip to local stream sites in an urban subwatershed, conducting student action projects, and releasing trout in streams. Hands-on class and schoolyard instruction includes eight periods where students learn environmental literacy, stewardship, and information about careers in the sciences. Students are learning about stream water ecology, watershed systems, geography, water chemistry and how human actions—including their own—affect watershed health. Students are identifying and implementing a concrete action they can take to preserve the Bay's health using Earth Force's "Curriculum for Community Action & Problem Solving." Through training and guided experiences, middle school teachers are becoming proficient in the use of experiential learning and place-based methods in

environmental and science education, and are increasing their environmental literacy and knowledge of NGSS-aligned environmental engineering solutions.

4. Through the Student Stewards of the Cecil County Watershed Program, Fair Hill Nature Center is working with all of the Cecil County Public School ninth graders to provide Meaningful Watershed Educational Experiences throughout the school year, including classroom instruction, three hours of field experiences, and guiding the students through implementation of action projects with each of five schools in partnership with their municipalities. Action project results are being displayed at the Elkton Public Library and students are presenting to a panel of local professionals. FHNC is providing teacher professional development throughout the school year and incorporating college students into the program implementation.

5. The Howard County Conservancy is engaging 9th and 10th grade Biology students from all 13 Howard County high schools (totaling over 800 students) who are taking part in a replicable, year-long assessment of their watershed utilizing biological, chemical and physical testing. The final product of this year-long study is a student-developed **Watershed Report Card** which students use to advocate with county leaders. In order to provide more scientific rigor to the student stream study, the program is also leading efforts to develop an improved student stream survey tool based on the Maryland Biological Stream Survey data.. The program is also developing a Watershed Report Card curriculum guide to build the capacity among 50+ teachers to implement real-world stream studies connected to the curriculum. Teachers across Maryland can participate in two professional development training sessions to learn about these new resources.

6. The “Creek Freaks” Meets “Trout in the Classroom” program, an extension of Izaak Walton League’s stream education program in partnership with Trout Unlimited, is increasing stewardship of Maryland waters by engaging students in meaningful watershed educational experiences with a combination of classwork, field studies of local streams, and student-led stream stewardship projects. Montgomery County Public Schools (MCPS) and Frederick County Public Schools (FCPS) sixth-grade students are gaining hands-on experience in assessing the health of local waterways. Participating students will be led through learning about water quality requirements for healthy trout streams, and comparing stream conditions near their schools to streams approved for trout release. Students are designing and implementing their own stewardship projects focusing on water quality monitoring and improvement.